

The Impact of Hyperpigmentation on the Lives of Patients

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ABSTRACT

Hyperpigmentation is a prevalent condition that disproportionately impacts individuals with skin of color, diminishing their quality of life and psychosocial well-being. There is a need to better understand the experiences, motivations, and expectations of patients seeking hyperpigmentation treatment. A cross-sectional survey was performed to analyze the perspectives and experiences of patients with hyperpigmentation. While over half (51.37%) of participants view their hyperpigmentation as “more bothersome than its initial cause,” there is a notable lack of routine dermatological care and sunscreen use. Of the respondents, 40.67% had never tried any treatments and among those who have, 34.67% were dissatisfied with the results. Expectations for treatment outcome timeframes varied, with 37.06% expecting results within 1 to 4 weeks. Of the participants, 52.67% reported being “not at all” or only “slightly” informed about current treatment options and only 16.32% feel “very” or “extremely” satisfied with current treatments. If their hyperpigmentation was successfully treated, 43.33% of respondents anticipated a very positive impact on their self-esteem. The current study highlights a critical need for improved patient education and tailored treatment approaches in hyperpigmentation practices. Enhancing patient knowledge about treatment options and setting realistic expectations may bridge the gap between patient experiences and treatment outcomes.

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INTRODUCTION

Hyperpigmentation results from excessive deposition of melanin pigment in the epidermis and/or dermis layers following inflammation or injury.¹ The term hyperpigmentation encompasses numerous conditions causing discoloration, pigmentation, and darkening of the skin including melasma, post-inflammatory hyperpigmentation (PIH), ephelides, and lentigines.¹⁻³ Although a common skin condition prevalent among individuals across all demographics, hyperpigmentation disproportionately impacts individuals with skin of color in terms of both frequency and severity.⁴ The prevalence of PIH is as high as 9.99% in African American patients.⁴ Asian patients with darker skin also have a higher reported prevalence of PIH compared to Caucasian individuals.⁴

Hyperpigmentation is generally considered a benign condition, but it has a significant negative impact on patient quality of life and psychosocial well-being.⁵ One study found that among patients diagnosed with a pigmentary disorder, 47% felt self-conscious about their skin to some degree, 33% felt unattractive because of their skin, and 24% felt that their skin affected their daily activities.⁵ Another study found that 54% of patients express embarrassment due to their hyperpigmentation, with 22% experiencing a severe negative impact on their quality of life.⁶ Nearly half of those affected by hyperpigmentation report

applying makeup daily to conceal it, spending an average of 20.8 minutes each day on this routine.⁷

The hyperpigmentation treatment market has an estimated value of \$5.0 billion as of 2023, and is projected to reach \$9.5 billion by 2031.⁸ With some patients being willing to allocate up to 13.3% of their monthly income to address their symptoms, the projected growth of this market underscores its impact on patients and highlights the importance of addressing hyperpigmentation.⁷

There is a need to better understand the motivations, expectations, and experiences of patients seeking hyperpigmentation treatment. The aim of this study is to explore patients' perspectives on hyperpigmentation, including uncovering their treatment expectations, barriers to care, and satisfaction levels with current hyperpigmentation treatments. These insights can guide physicians to better align their practices with patients' diverse expectations and challenges.

MATERIALS AND METHODS

This study is a single-center, observational, cross-sectional, in-person questionnaire-based survey distributed to participants with a history of hyperpigmentation at SUNY Downstate Health Sciences University in Brooklyn, New York. A hard-copy

survey was distributed to participants following IRB approval. Participants were eligible if they were 18 years or older, spoke English, and had a history of hyperpigmentation. Data analysis was performed using Microsoft Excel.

RESULTS

A total of 150 individuals participated in the study between February 2024 and May 2024. Demographic data are provided in Table 1.

A high proportion of respondents (97.33%) reported they knew what hyperpigmentation is (Figure 1A). For those unfamiliar with hyperpigmentation, the medical terminology was explained to them, and participants proceeded with the survey if they reported a history of hyperpigmentation. The majority of respondents (59.06%) do not routinely wear sunscreen or see a dermatologist (78.67%) (Figure 1B and 1C). Approximately half of the participants (51.37%) perceive their hyperpigmentation as "more bothersome than its initial cause" (Figure 1D). The face was the most commonly affected area (80.67%), followed by the arms (28.00%), and legs (27.33%) (Figure 1E). The predominant triggers identified included "acne" (60.67%), "sun exposure" (51.33%), and skin trauma from "picking or scratching" (31.33%) (Figure 1F). Regarding information sources, participants primarily reported learning about hyperpigmentation through "the internet" (70.00%), "dermatologists" (43.33%), and "social media" (36.67%) (Figure 1G).

Treatment Experiences and Expectations

Of the respondents, 40.67% had never tried any hyperpigmentation treatments, 34.67% had tried treatments but were left unsatisfied with results, and 24.67% had tried treatments and were satisfied with results (Figure 2A). Participants most often tried "over the counter treatments" (59.33%), "prescription medications" (32.67%), and "professional treatments at a doctor's office or clinic" (20.00%). 10% of respondents have tried "alternative or home remedies," including turmeric, carrots, lemon, cucumbers, a mix of baking powder and peroxide, and homemade sugar scrubs (Figure 2B). Participants' monthly spending on hyperpigmentation treatments ranged from "\$0" (42.67%), "less than \$50" (40.67%), "\$50-100" (8.67%), to "more than \$100" (8.00%) (Figure 2C).

Expectations regarding the time required to observe results from treatment ranged from "less than 1 day" (2.80%), "1-7 days" (13.29%), "1-4 weeks" (37.06%), "5-12 weeks" (31.47%), "4-12 months" (10.49%), and "over 1 year" (4.20%) (Figure 2D). When asked about their primary goal when treating their hyperpigmentation, 90.54% of participants indicated "lighter," 5.41% indicated "the same," 0.68% indicated "darker," and 3.38% indicated "other," with fill in responses including "evening out skin tone" and "gone" (Figure 2E).

Treatment Satisfaction and Barriers

Many participants do not feel well informed about the different treatment options available for hyperpigmentation, with responses ranging from "not at all" (20.00%), "slightly" (32.67%), "moderately" (34.00%), "very" (8.00%), and "extremely" informed (5.33%) (Figure 3A). Satisfaction with current treatment options also varied, ranging between "not at all" (13.61%), "slightly" (34.01%), "moderately" (35.37%), "very" (12.24%), and "extremely" satisfied (4.08%) (Figure 3B).

TABLE 1.

Demographics (n=150)	
Characteristic	Respondents
Age, mean years (SD)	33.64 (12.07)
Age group (%)	
18-29	53.10%
30-39	22.07%
40-49	13.79%
50-59	4.83%
60-69	4.83%
70-79	1.38%
Gender (%)	
Female	81.88%
Male	18.12%
Race (%)	
White	22.00%
Black/African American	44.00%
Asian	23.33%
Native Hawaiian and other Pacific Islander	0.67%
American Indian/Alaskan Native	0.00%
Two or More Races	3.33%
Other	6.67%
Hispanic/Latino ethnicity (%)	10.74%
Education (%)	
Less than a high school diploma	1.33%
High school diploma or equivalent	11.33%
Associate degree	5.33%
Bachelor's degree	46.00%
Graduate degree	36.00%
Employment status (%)	
Full Time	52.67%
Part Time	5.33%
Student	38.67%
Self-employed	0.67%
Retired	2.67%

FIGURE 1. Respondents' experiences with hyperpigmentation. Respondents indicate their (A) awareness of hyperpigmentation, (B) sunscreen habits, (C) if they see a dermatologist, (D) perceptions of hyperpigmentation as more bothersome than its initial cause, (E) hyperpigmentation location, (F) triggers, and (G) information sources.

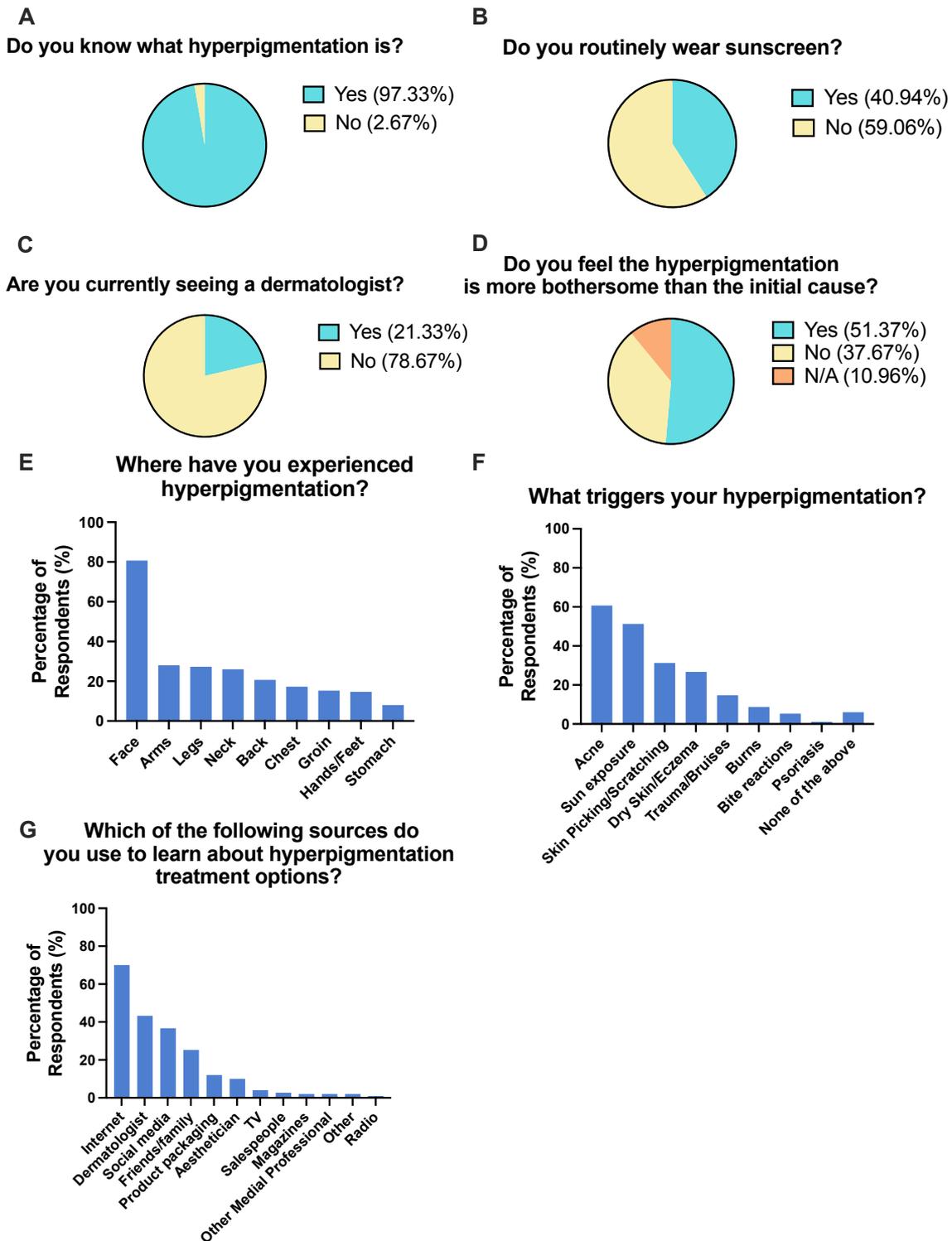


FIGURE 2. Respondents' hyperpigmentation treatment experiences and expectations. Respondents indicate their (A) previous treatment experience, (B) types of treatments tried, (C) expenditure on treatment, (D) expected timeframe for seeing results, and (E) primary treatment goal.

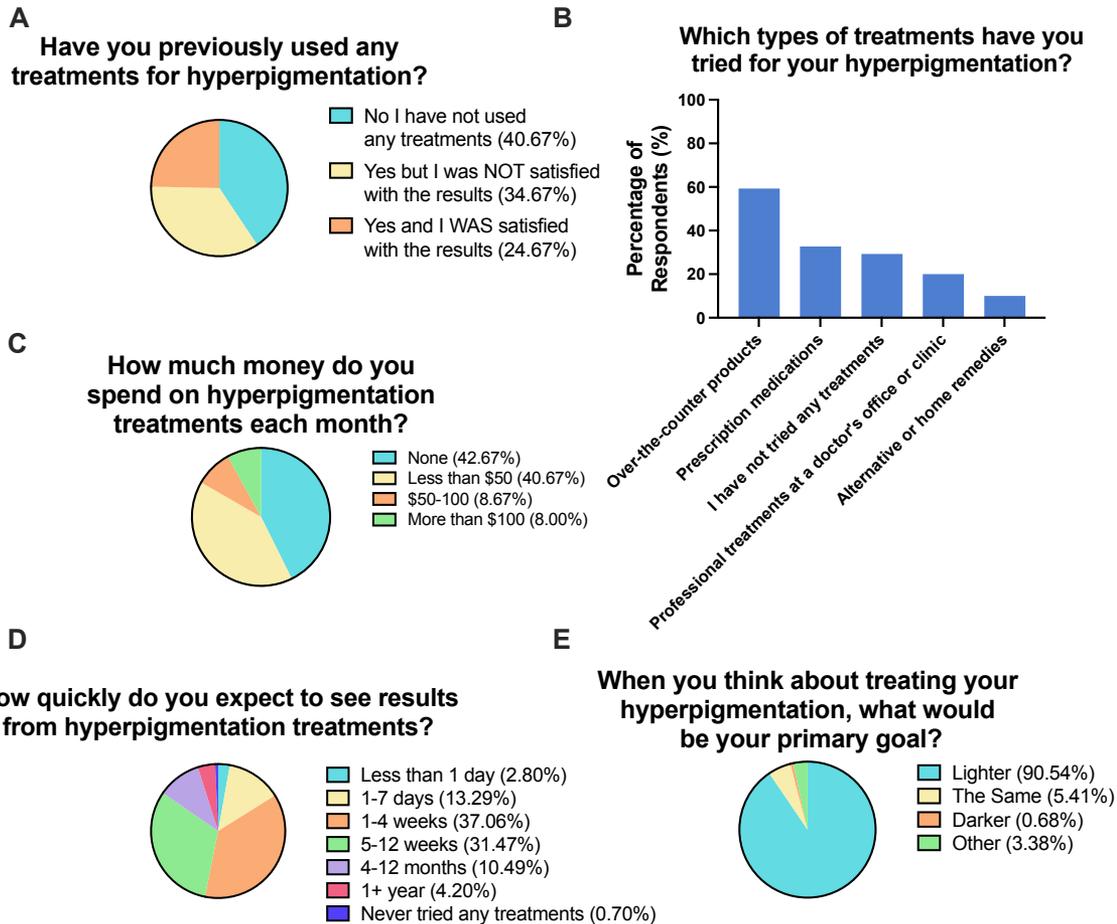


FIGURE 3. Respondents' perceptions regarding hyperpigmentation treatments. Respondents indicate their (A) perceived knowledge of treatments, (B) satisfaction with current treatments, (C) impact of hyperpigmentation on self-esteem, and (D) anticipated impact of successful treatment on self-esteem.

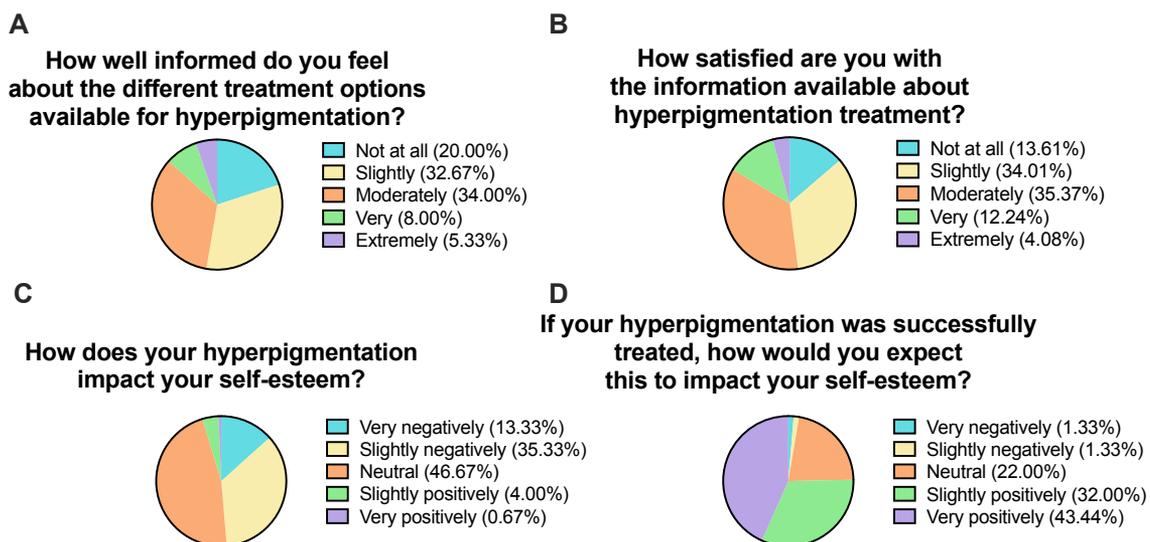
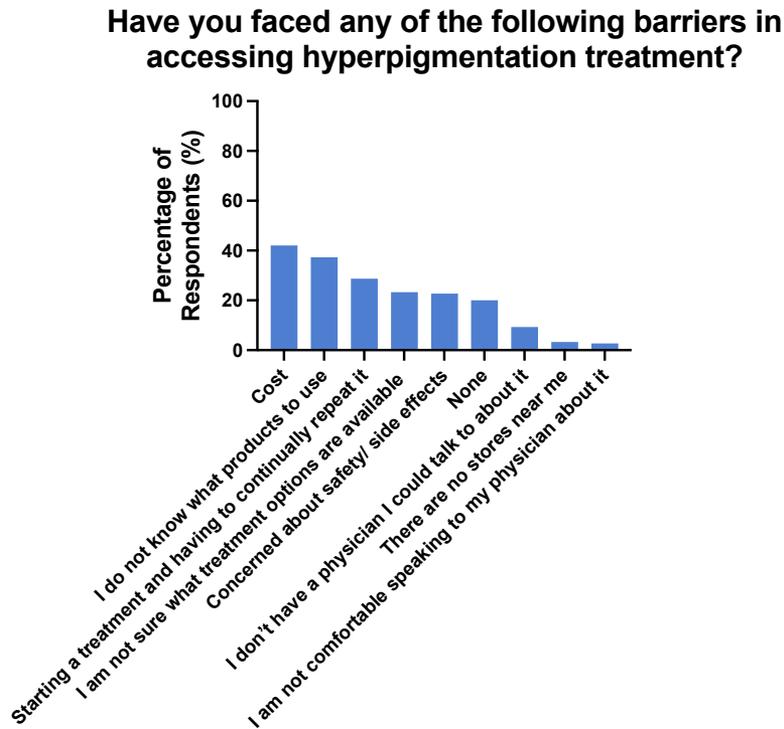


FIGURE 4. Barriers to accessing hyperpigmentation treatment. Respondents indicate their barriers to accessing hyperpigmentation treatment.

Participants frequently cited “cost” (42.00%), “uncertainty about which products to use” (37.33%), and “concerns about the need for ongoing treatment” (28.67%) as barriers to accessing hyperpigmentation treatments (Figure 4).

Impact on Self-Esteem

Respondents indicated their hyperpigmentation impacted their self-esteem “very negatively” (13.33%), “slightly negatively” (35.33%), “neutral” (46.67%), “slightly positively” (4.00%), and “very positively” (0.67%) (Figure 3C). If their hyperpigmentation were to be successfully treated, participants expected this to impact their self-esteem “very negatively” (1.33%), “slightly negatively” (1.33%), “neutral” (22.00%), “slightly positively” (32.00%), and “very positively” (43.33%) (Figure 3D).

DISCUSSION

Herein, we provide comprehensive insights into patients’ experiences and expectations regarding hyperpigmentation. To our knowledge, this is the first study to comprehensively analyze patients’ experiences with hyperpigmentation, encompassing disease perception, treatment experiences, barriers to care, knowledge gaps, and satisfaction with current treatments.

Approximately half (51.37%) of respondents endorsed their hyperpigmentation being more bothersome than the initial cause, consistent with a previous survey on acne-related PIH that found 50% of patients view their PIH as more bothersome than their initial acne.⁹ Despite patients’ high awareness

and self-reported knowledge about hyperpigmentation, there is a notable discrepancy in patients’ management of their hyperpigmentation. The majority of participants do not regularly use sunscreen or consult dermatologists, potentially exacerbating their condition. UV radiation is a known contributor to hyperpigmentation, and recent studies show that visible light also contributes to hyperpigmentation by acting synergistically with UV-A.⁹⁻¹¹ Physicians should recommend patients use a >30 SPF iron-oxide containing tinted sunscreen.⁹⁻¹¹ Patients with skin of color are less likely to wear sunscreen and are also more prone to hyperpigmentation, emphasizing the importance of educating these patients on sun protective practices.¹²⁻¹⁵

The primary source of information for most participants was the internet, consistent with previous research that demonstrated 82.4% of patients obtain dermatology information from the internet or social media, with 16.1% considering it their primary source for medical information.¹⁶ While the internet is a convenient, accessible, and inexpensive source of information, it also poses risks of misinformation.^{17,18} A cross-sectional analysis of 385 online dermatology websites found that 44.7% of online content was classified as “imprecise” and 20% as “confusing.”¹⁹ An analysis of psoriasis-related videos on YouTube found that only 28.1% of recommended treatments were consistent with Grade A recommendations by the American Academy of Dermatologists.²⁰ It is crucial to make patients aware of these potential sources of misinformation and actively correct any misconceptions they may have.

Nearly half of respondents have never tried any hyperpigmentation treatments. Despite the high prevalence of hyperpigmentation, over 50% of respondents in the current study feel "not at all" or only "slightly" informed about available treatment options and less than 20% of respondents feel "very" or "extremely" satisfied with current treatments, highlighting the need for dermatologists to better educate patients on available management strategies. Various treatment options are available for hyperpigmentation, including topical creams, lasers, light therapy, oral therapy, micro-needling, and chemical peels. Topical hydroquinone and triple combination cream (TCC) therapy (hydroquinone, retinoid, and corticosteroid) are currently recommended as first line-therapy.⁹⁻¹¹ However, these may be associated with the permanent unacceptable side effect of ochronosis.²¹ Several alternative treatments including tranexamic acid, cysteamine, azelaic acid, kojic acid, and ascorbic acid are more well-tolerated and not associated with ochronosis.^{9-11,22,23}

The dissatisfaction expressed by participants regarding treatment outcomes, with only 24.67% satisfied, underscores a critical gap in patient education and the importance of setting realistic patient expectations. Many patients expect quick results; however treatment for hyperpigmentation often involves a prolonged duration and may result in low patient adherence.^{10,24} One commonly used protocol requires 8 weeks of daily TCC application, followed by 6 months of twice weekly application for effective treatment and to prevent reoccurrence of melasma.²⁵ Depending on the depth of melanin deposition, treatment efficacy may vary.²⁴ Setting realistic treatment expectations may promote treatment adherence and improve both satisfaction and clinical outcomes. Notably, nearly 90% of patients indicated that their primary goal for treating hyperpigmentation was to make it "lighter." However, in the authors' clinical experience, what patients often mean by "lighter" is achieving an even skin tone that matches the surrounding areas. Both hyperpigmentation and hypopigmentation can significantly affect quality of life, with hypopigmentation sometimes having an even greater impact.^{26,27} One study demonstrated that patients with vitiligo have significantly worse quality of life compared to patients with melasma or lentiginosities.²⁷ The current study reveals that approximately 75% of patients expected a "slightly" or "very" positive impact on self-esteem with successful treatment of their hyperpigmentation, underscoring the profound psychological implications of hyperpigmentation. By effectively treating hyperpigmentation, dermatologists can not only improve the physical appearance but also the mental well-being of their patients.

Limitations of this study include a reliance on self-reported data and a single-center design, which may not reflect the broader hyperpigmentation patient population. The study's strengths include a diverse racial and ethnic participant population and a comprehensive scope of the questions regarding participants'

experiences with hyperpigmentation. Additionally, our survey focused on individuals with a history of hyperpigmentation, providing valuable insights into the perspectives of those suffering from hyperpigmentation. Future research may include a multi-center design to enhance the representativeness and generalizability of the findings. Future studies could also examine quality of life measures, such as the Dermatology Life Quality Index (DLQI), to further understand the impact of hyperpigmentation on patients' lives.

CONCLUSION

Herein, we uncover the experiences and expectations of patients with hyperpigmentation, highlighting the importance of improved management strategies including increasing sunscreen use and enhancing patient education about available treatments. This study also underscores the impact of hyperpigmentation on patients' self-esteem and identifies common barriers to treatment. These insights may enable dermatologists to better tailor their care, thereby improving patient satisfaction and outcomes.

DISCLOSURES

The authors have no conflicts of interest to disclose.

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